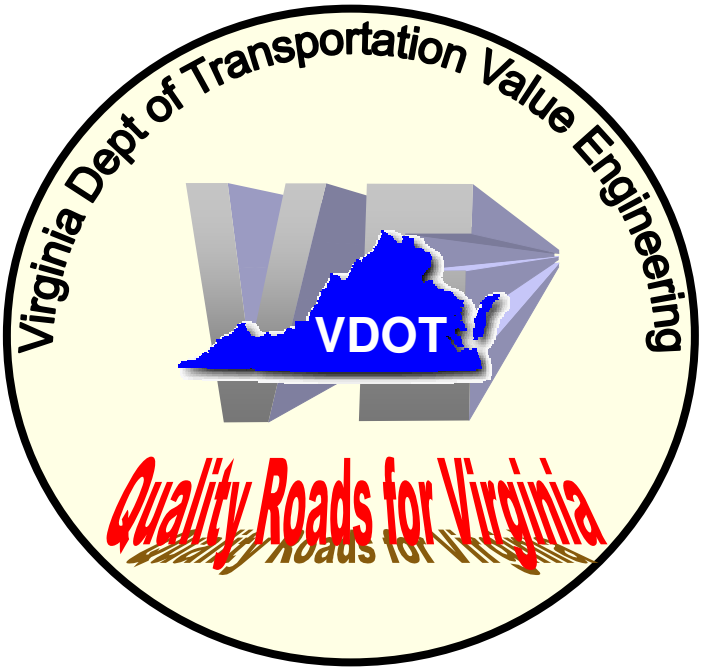
NOTICE

This Value Engineering Report makes several references to potential wetland area in the vicinity of the trail and stream crossing along the Progress Street Extension. Field studies subsequent to this report have confirmed that wetlands are **NOT** present within the footprint of the proposed alignment and construction limits of the Progress Street Extension.

Value Engineering Study Report



Givens Lane Widening & Progress Street Extension (Town of Blacksburg)

U000-150-114, P101, R201, C501

PPMS# 17314

Study Date: 12/6/05 - 12/8/05

We Keep Virginia Moving VDOT

A Value Engineering Study of the subject project was conducted on 12/6/05 to 12/8/05. Members of the VE team were:

Barry Arrington	Right of Way Agent	Salem District
Brian Blevins	Location and Design	Salem District
Dail Stancil	Construction Engineer	Salem Construction
Fred Davis	Environmental	Salem District
John Holst	Traffic Engineering	Salem District
Len Gisiner	Structure and Bridge	Salem District
Randy Formica	Town Engineer	Town of Blacksburg

This project is designed to improve geometrics on Givens Lane and extend Progress Street north to connect to Givens Lane. It is a priority project for the Town of Blacksburg and in their 2046 Comprehensive Plan. The project includes sidewalks, bicycle lanes and an 8' trail adjacent to Givens Lane as part of the new construction.

The project will be delivered as a Design-Build Project. An on-call design consultant will develop the plans up to the 30% Preliminary Field Inspection stage. The project will then be awarded to a Design-Build contractor which will complete the plans and construction.

The VE team identified the project's basic functions as "Convey Traffic", "Make Access", "Improve Geometrics" and "Improve Safety". The team focused on: (1) the grade separated structure on the Progress Street extension; (2) intersections; (3) the Tom's Creek project overlap; and (4) the Town's initiative to see traffic calming measures in the design. The VE team developed five recommendations for consideration. In all cases the following recommendations satisfy the basic functions of this project.

Recommendation 01 - Provide a uniform roadway typical by constructing 11' lanes on the Progress Street extension.

The current Givens Lane roadway typical section show two 11' lanes, with a 4' bike lane and 2.5' curb and gutter on both sides of the road. The Progress Street extension typical section has two 12' lanes, with a 4' bike lane and 2.5' curb and gutter on both sides of the road. This recommendation proposes to provide 11' lane widths throughout the entire project. The 11' lanes provide a uniform roadway typical section and saves some Right of Way and pavement cost. It will also serve as a measure of traffic calming with the 11' lanes.

Potential savings/cost avoidance: $12,290

Recommendation 02A - Increase capacity and provide traffic calming and at the Progress Street and Givens Lane intersection by constructing a roundabout.

The current approach shows an intersection at Givens Lane and the Progress Street extension with no provisions for turning movements. This recommendation proposes to construct a roundabout at this intersection. It provides a safer intersection for vehicles and pedestrians, increases capacity and accommodates future growth. In addition, the roundabout provides traffic calming as requested by the Town. It also has the potential for a gateway effect with landscaping in the roundabout. While the roundabout will incur a minor increase in initial construction cost, it provides a long term savings by eliminating the need to expand the intersection as future traffic warrants. It appears that additional Right of Way will be minimal.

Potential cost: N/A

Recommendation 02B - Increase capacity and improve traffic flow at Progress Street and the Givens Lane intersection by constructing a turn lane on westbound Givens Lane to Progress Street south.

The current approach shows an intersection at Givens Lane and the Progress Street extension with no provisions for a turn lane. This approach recommends constructing a turn lane on westbound Givens Lane onto Progress Street southbound. It provides a safer intersection by reducing potential rear end collisions. In addition, it Improves capacity and traffic flow. In order for the lanes to align across the intersection, additional pavement and Right of Way will be required on both the northeast and northwest quadrants. It will provide for a future turn lane from eastbound Givens Lane onto Progress Street Southbound.

Potential cost: $3,786

NOTE: Recommendations 2A & 2B are mutually exclusive

Recommendation 03 - Eliminate any impact to wetland area by constructing a bridge over the trail and creek on the Progress Street extension.

The current proposal indicates a box culvert or CONSPAN type structure would be used over the trail and creek on the Progress Street Extension. During the team site visit, it appeared the creek is likely surrounded by a forested wetland from the trail to the edge of the thick vegetation across the creek. This potential wetland area exceeds the width that a box culvert or CONSPAN type structure could span. This recommendation proposes to construct a bridge structure to cross the trail and wetland. The bridge would eliminate any need to mitigate the forested wetland (a 2:1 mitigation), cut down on the amount of borrow required for a box culvert or CONSPAN and reduce Right of Way by reducing height of fill slopes. The bridge structure will likely have to be a steel beam girder which can span the 75' to 80' without a pier. It is anticipated the bridge cost will be slightly less than a box or CONSPAN structure.

Potential savings/cost avoidance: $38,620

Recommendation 04 - Improve capacity and traffic flow at intersection of Givens Lane and North Main Street by constructing a left turn/through lane on givens lane.

The current design does not provide for any turning movement at the intersection of Givens Lane and North Main Street. This recommendation proposes to add a 12' center turn lane with 100' storage and 100' taper from eastbound Givens lane to northbound North Main Street. In order for lanes to align across the intersection, additional pavement will be required on both the southwest and southeast quadrants of the intersection. It Improves capacity and reduces delays for right turns onto North Main Street. In addition, it frees up additional fill on a borrow job. The Right of Way is available; however, this approach will require additional pavement.

Potential cost: $3,786

Recommendation 05 - On the Tom's Creek project, modify the project's termini on Chickahominy to prevent any rework on the Givens Lane widening project.

The current design includes approximately 200' on the Chickahominy extension of the Tom's Creek project that is scheduled to begin construction in the spring of 2006. In order to prevent any rework on this project, this recommendation proposes to work closely with the Tom's Creek project and adjust the Tom's Creek termini to begin at the Givens Lane widening project. The Design-Build contractor will need to work closely with the Tom's Creek contractor in developing a plan revision that provides a seamless connection between the two projects.

Potential savings/cost avoidance: N/A

COMMENTS:

Once in final design, consider knocking off some of the high spots along Givens Lane to improve vertical curves on Givens Lane.

Section 1 INTRODUCTION

Project Location Map(s)
Typical Section
Project Description
Authorizing Persons


Givens Lane Widening and Progress Street Extension Project
North Main Street
Givens Lane
Progress Street Extension
Tom's Creek Project Termini

Study Identification

Project No. U000-150-114, P101, R201, C501	Study Date: 12/6/05 – 12/8/05
Project location (Termini)	Field Inspection Date:
From: .06 miles South Ashford Court/Givens Lane	To: 0.07 miles East North Main Street/0.01 miles North Cherokee Drive

Project Description

Length:	Total Project Cost:		Type of Funds:
1.48 miles	TBD		Federal
Major Project Components:			Functional Class:
Pavement, grade separated Structure, intersections and Tom's Creek Project overlap.			Urban Collector
Design Speed:	Projected Traffic	Design Year	Ad. Date
30 mph	ADT: 4380	2030	6/6/06
	DHV: 438		

Project Manager

Name	Location	Phone
Scott Woodrum	Salem District	(540) 378-5048

Authorizing Persons

Name	Title	Phone Number
Richard Caywood	Salem District Administrator	(540) 387-5348
Rob Cary	Salem Preliminary Engineering	(540) 387-5356
David Clarke	Christiansburg Residency	(540) 381-7200
Mohammad Mirshahi	Central Office L&D	(804) 786-2507
Leo Rutledge	Local Assistance Division	(804) 786-2586
Paul Johnson	Salem Environmental	(540) 387-5432
Robert Yates	Salem Traffic	(540) 387-5395
Nancey Widgen	Salem Structure and Bridge	(540) 387-5350

Section 2 RECOMMENDATIONS

Summary of Potential Savings/Cost Avoidance
Developed Recommendation Information Including

Cost Worksheet/Calculations
Recommendation Photos
Contact Information

SUMMARY OF RECOMMENDATIONS

#	Description	Initial	Lifecycle	Total
1	Provide a uniform roadway typical by constructing 11' lanes on the Progress Street extension.	$12,290		$12,290
2A *	Increase capacity and provide traffic calming and at the Progress Street and Givens Lane intersection by constructing a roundabout.	N/A		N/A
2B *	Increase capacity and improve traffic flow at Progress Street and Givens Lane intersection by constructing a turn lane on westbound Givens Lane to Progress Street south.	($3,786)		($3,786)
3	Eliminate any impact to wetland area by constructing a bridge over the trail and creek at the Progress Street extension.	$38,620		$38,620
4	Improve capacity and traffic flow at intersection of Givens Lane and North Main Street by constructing a left turn/through lane on givens lane.	($3,786)		($3,786)
5	On the Tom's Creek project, modify the project's termini on Chickahominy to prevent any rework on the Givens Lane widening project.	N/A		N/A

* NOTE: Recommendation # 2A and 2B are mutually exclusive

Recommendation 01

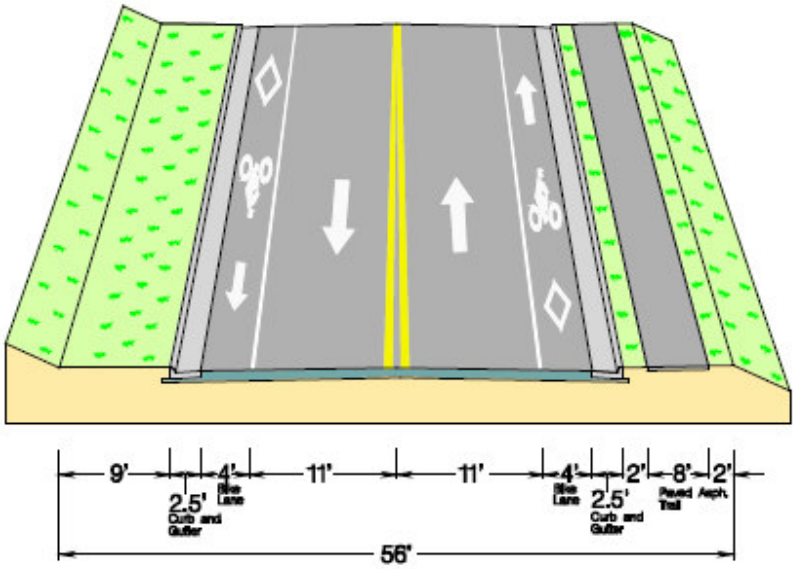
Cost Worksheet Engineering: 12.00% Contingencies: 10.00%

Construction Element				Original Estimate		New Estimate	
Item	Units	EC/UT	Cost/Unit	# Units	Total	# Units	Total
Asphalt SM 9.5 D	TON	EC	$114.00	264	$36,717.12	248	$34,491.84
8" Asphalt concrete base BM 25.0	TON	EC	$70.00	1459	$124,598.60	1368	$116,827.20
8" Aggregate base 21-B	TON	EC	$20.00	1514	$36,941.60	1420	$34,648.00
					Sub Totals: $198,257		$185,967
						Initial Cost Savings:	$12,290

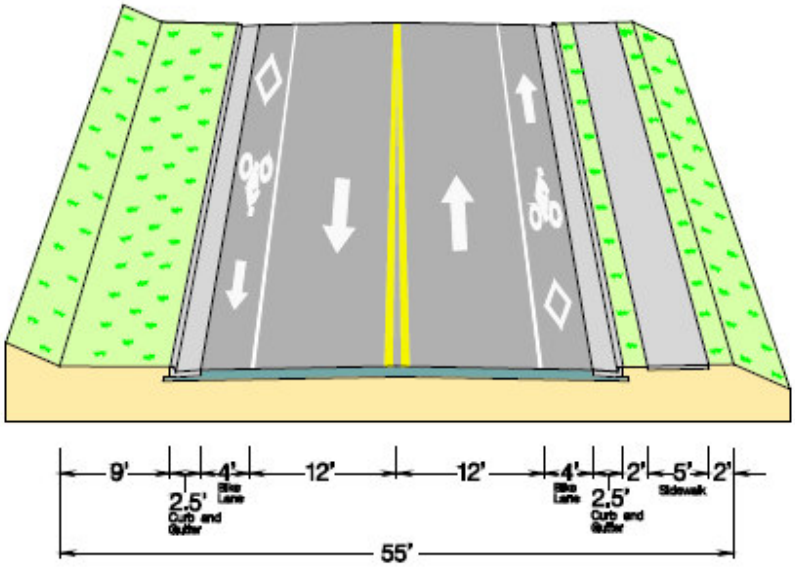
Recommendation 01

AS DESIGNED TYPICAL SECTIONS

Givens Lane Widening
From Chickahominy Drive to North Main Street



Progress Street Extension
From Cherokee Drive to Givens Lane

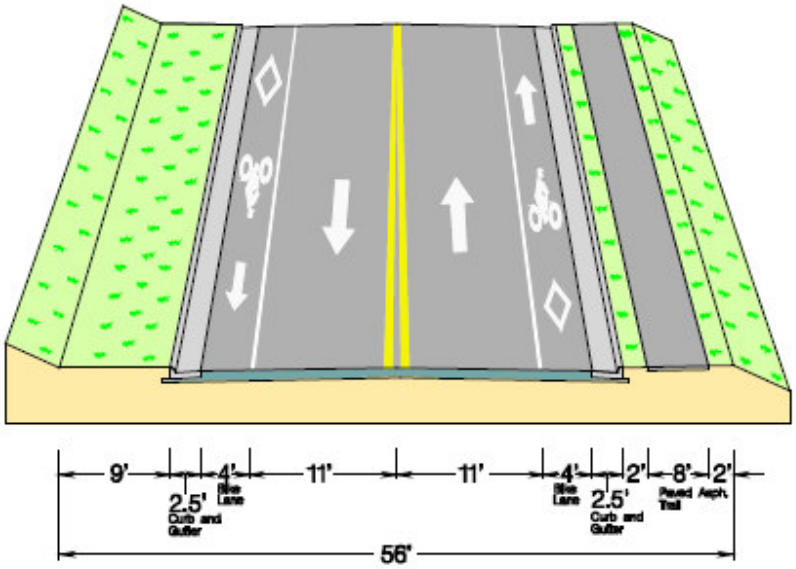


Not to Scale

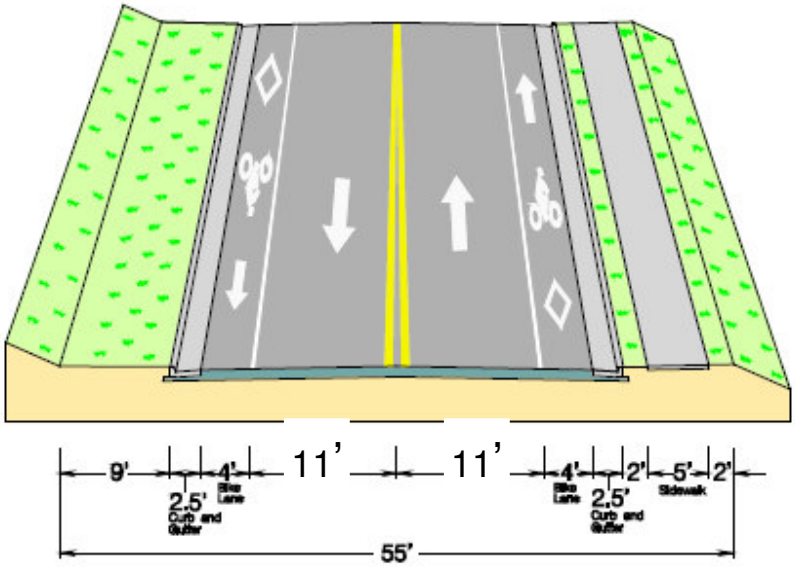
Recommendation 01

PROPOSED TYPICAL SECTIONS

Givens Lane Widening
From Chickahominy Drive to North Main Street



Progress Street Extension
From Cherokee Drive to Givens Lane



Not to Scale

Recommendation 02A

Proposed Roundabout:

Recommendation 02B

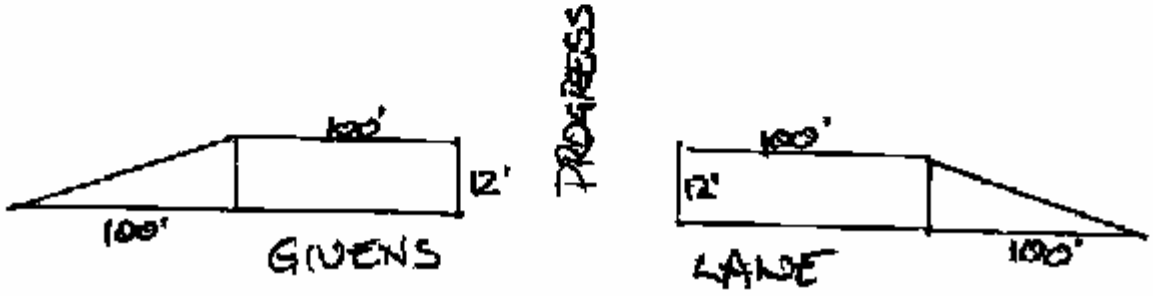
Cost Worksheet Engineering: 12.00% Contingencies: 10.00%

Construction Element				Original Estimate		New Estimate	
Item	Units	EC/UT	Cost/Unit	# Units	Total	# Units	Total
Right of Way	SF	EC		0		360	$1,000
Pavement	SF	EC	7.74	0		360	$2,786
					Sub Totals:		$3,786
						Initial Cost :	$3,786

Recommendation 02B

Calculations

ROW & PAVEMENT REQUIRED
(NOT TO SCALE)



$12' \times 100' = 120$ SQ FT

$\frac{1}{2} \times 12 \times 100' = 60$ SQ FT

180 SQ FT

SAME

2×180 SQ FT $= 360$ SQ FT

ROW & PAVEMENT NEEDS SAME.

Recommendation 02B

As Designed:

Recommendation 02B

Proposed Design:

Recommendation 03

Cost Worksheet Engineering: 12.00% Contingencies: 10.00%

Construction Element				Original Estimate		New Estimate	
Item	Units	EC/UT	Cost/Unit	# Units	Total	# Units	Total
Bridge	EACH	EC	$304,000.00			1	$370,880.00
Borrow	EACH	EC	$60,000.00	1	$73,200.00		
Wetland Mitigation	EACH	UT	$135,000.00	1	$135,000.00		
Box Culvert	EACH	EC	$165,000.00	1	$201,300.00		
				Sub Totals:	$409,500		$370,880
					Initial Cost Savings:		$38,620

Recommendation 03

Calculations

S.F. of Bridge

+ ≈ 38'x80' = 3040 sf x $100.00 (steel Beam)/sf = $304,000.00

- Borrow Over Box Culvert

10,000 cy @ $12/cy on Transport est.
Assumed ½ saved using bridge = 5000 cy ($12/cy) = $60,000

Mitigation

$135,000

Box Culvert + Borrow + Mitigation

$166,000 + 60,000 + 135,000 = $360,000.000

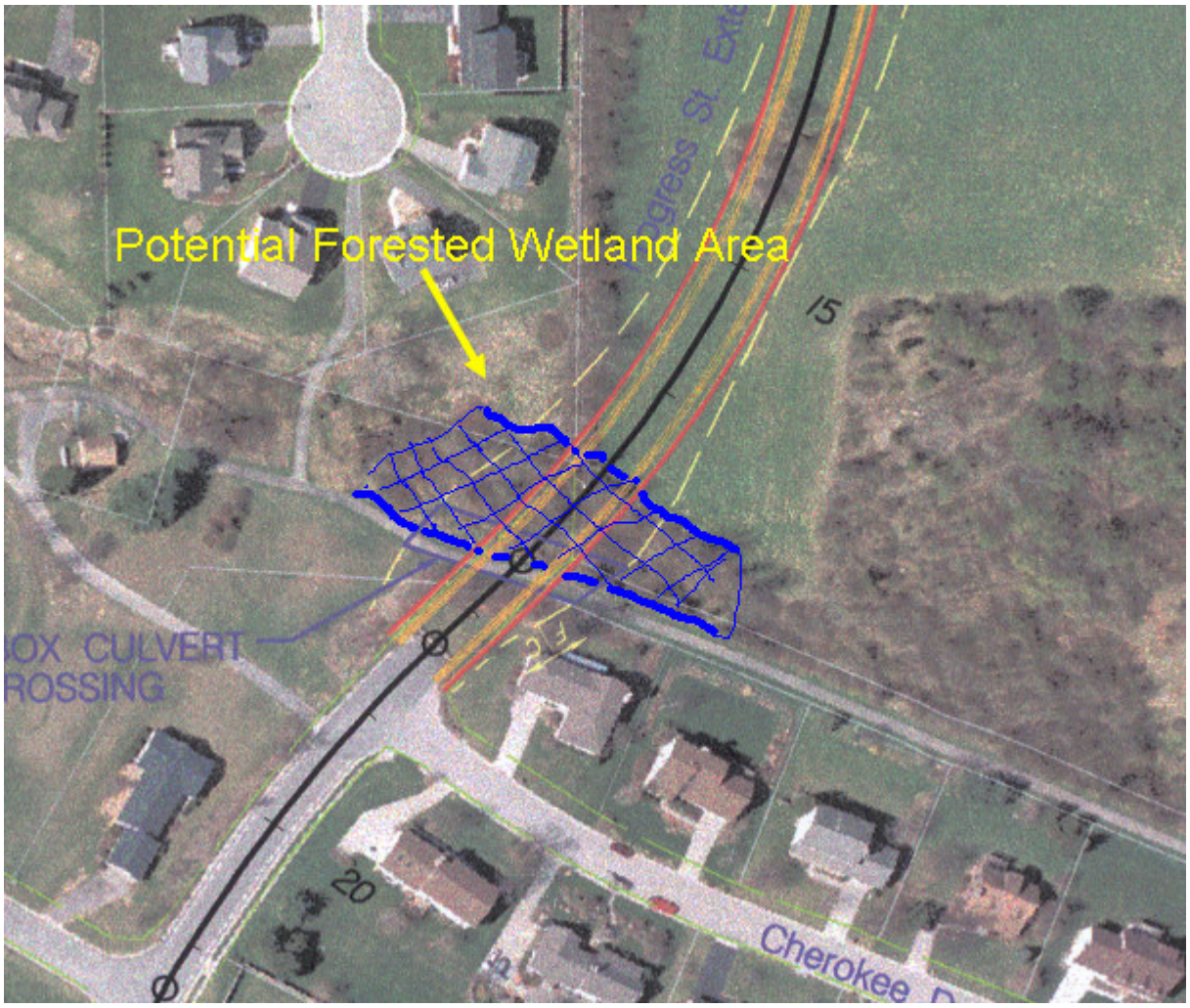
Savings

$360,000 Box
$304,000 Bridge

≈ $56,000

Recommendation 03

Bridge Location:



Recommendation 03

Contact: Brenda Willis

Organization: Environmental

Telephone#:

Subject: Status of area at Creek next to trail on Progress Street Extension

Information from Contact: Brenda indicated this area to the limits of the vegetation is considered a forested wetland which requires a 2:1 mitigation. The cost would approach $135,000.

Team Member: Len Gisiner

Date: 08-Dec-05

Recommendation 04

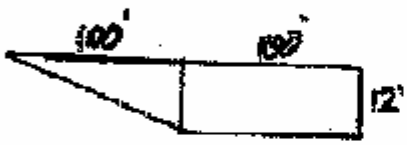
Cost Worksheet Engineering: 12.00% Contingencies: 10.00%

Construction Element				Original Estimate		New Estimate	
Item	Units	EC/UT	Cost/Unit	# Units	Total	# Units	Total
Right of Way	SF	EC		0		360	$1,000
Pavement	SF	EC	7.74	0		360	$2,786
					Sub Totals:		$3,786
						Initial Cost :	$3,786

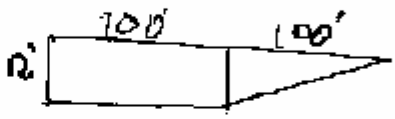
Recommendation 04

Calculations

ROW & EASEMENT REQUIRED
(NOT TO SCALE)



SCHEMATIC STRAIGHT LINE SKETCH FOR CURVES



½ × 100 = 120 SQ FT
½ × 12 × 100 = 60 SQ FT
180 SQ FT

SAME

2 × 180 SQ FT = 360 SQFT
ROW & PAVEMENT NEED SAME

* ROW ON SW QUADRANT PROVD NOT REQUIRED AS PROPERTY PROVS A TOTAL TAKE ALREADY.

Recommendation 04

As Designed:

Recommendation 04

Proposed Design:

Recommendation 05

Project Overlap:

Section 3 INVESTIGATION, SPECULATION AND EVALUATION PHASE RESULTS

Function Analysis
Creative Idea Listing
Team Rating of Creative Ideas

Item	Overall Project	Costs	

Function	Basic /Secondary
Convey Traffic	B
Make Access	B
Improve Safety	B

Creative Listing	Savings	Environmental	Operational	Construction	Acceptance	Total
~~Reduce pavement width~~						0
~~12' lanes throughout~~						0
~~Turn lane from Givens to Progress~~						0
~~Remove 2' grass strip from curb to sidewalk~~						0
~~Add 5' sidewalk to north side of givens~~						0
~~Retain existing sidewalk along Givens as control~~						0
~~Cons pan over creek and trail~~						0
Bridge over creek and trail	0	2	-1	0	1	2
~~Box culvert over trail~~						0
~~Re route trail~~						0
~~Pipe creek~~						0
~~Ford creek~~						0
~~Shorten Tom's Creek project/prevent rework~~						0
Modify Tom's Creek tie in to Givens project	1	0	0	2	2	5
~~At Whipple lower grade to reduce retaining wall~~						0
Knock off high spots throughout	0	0	1	0	2	3
~~Use property at N. Main and Givens for fill~~						0
~~Shift alignment more into trailers off homes~~						0
~~Retaining wall both sides, reduce height~~						0
~~Reduce trail width from 8' to 5'~~						0
Turn lane at Progress and Givens	0	0	2	0	2	4

Creative Listing	Savings	Environmental	Operational	Construction	Acceptance	Total
Round a bout at Progress and Givens	0	1	2	-1	2	4
Turn lane a N. Main and Givens	0	0	0	0	2	2
~~Stop project at Progress Street intersection~~						0
~~Big retention pond for borrow material~~						0
~~Modify curve on Progress Street connection~~						0
11' lanes throughout	1	1	0	0	2	4
~~Terminate project at North Main and Givens~~						0